METHOD OF TANNING HUMAN BODY BY MYSTING OR IMMERSION AT ELEVATED TEMPERATURE

The present invention relates to the use of self-tanning substances for application to the human skin, to corresponding methods of application to the human skin and to a cosmetic formulation which is suitable for said purpose.

The tanning of human skin is regarded as being a sign of wellbeing and health, particularly in regions where pale skin types prevail.

However, natural tanning by the UV radiation present in sunlight also harbours risks, such as premature skin ageing or also of suffering an increased risk of skin cancer.

In order to reduce this risk, UV filter preparations are supplied which are intended to filter harmful parts of UV radiation.

In contrast to this, so-called "pre-tan products" or "tan promoters" are also supplied, which have to be applied prior to solar irradiation. Once in the sun, a yellowing of these preparations occurs, which supposedly leads to a slight brown-yellow coloration of the epidermis, which additionally intensifies the "suntan" and thus shortens the time which the body has to be exposed to the sun.

A further method of artificial tanning, which is entirely independent of UV light, can be brought about by the hormones which are usually released in the body also as a consequence of (natural) UV irradiation and ultimately stimulate the melanocytes to synthesize melanin. Mention would be made in this connection, for example, of modifications of proopiomelanocortin (POMC), such as aMSH and synthetic variants (such as NDP), some of which have much higher activity than natural aMSH. Although these hormones can in principle bring about tanning, their use in cosmetics is

precluded since they are all substances with pharmacological activity (hormones), which should not be used widely without medicinal indication.

The colouring of the skin by self-tanning agents also takes place entirely without the action of sunlight. One problem with using self-tanning agents is the even application to the human skin in an adequately high active ingredient concentration.

For example, even application of creams or other preparations by hand is difficult and very time-consuming. In the case of self application, some areas of the body, particularly on the back, cannot be reached at all.

It has also been proposed to apply self-tanning solutions by means of active ingredient showers. However, in this method, large amounts of self-tanning agents are required and even application can likewise only be partially ensured.

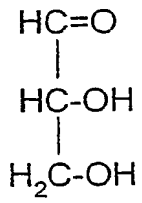
Surprisingly, it has now been found that the required active ingredient concentration can be reduced if the self-tanning agents are applied at elevated temperature.

The present invention thus firstly provides for the use of at least one self-tanning substance or a formulation comprising at least one self-tanning substance for application to the human skin, with application taking place at elevated temperature.

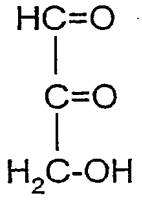
The present invention further provides a method of tanning the human body, which is characterized in that at least one self-tanning substance or a formulation comprising at least one self-tanning substance is dissolved in water, the solution is brought to a temperature which is elevated relative to room temperature and the solution is applied to the human body.

The present invention further provides cosmetic formulations which are suitable for the use according to the invention in a particular manner. Cosmetic formulations comprising at least one self-tanning substance, characterized in that the formulation comprises at least one fatty carrier and at least one hydrophilic solvent are therefore claimed.

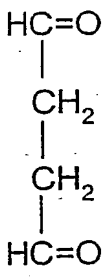
For the purposes of the present invention, self-tanning substances or self-tanning agents are understood as meaning all substances or mixtures of substances which are able to tan human skin without the effect of UV radiation. Advantageous self-tanning agents which may be used for the purposes of the present invention are the following substances:



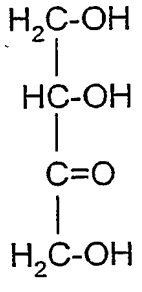
glycerol aldehyde



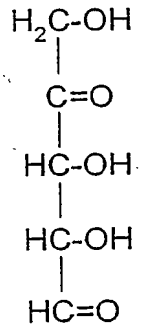
hydroxymethylglyoxal



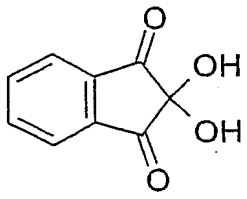
γ-dialdehyde



erythrulose

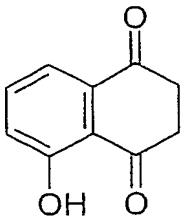


6-aldo-D-fructose



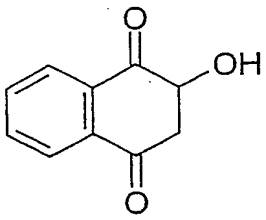
ninhydrin

Mention is also made of 5-hydroxy-1,4-naphthoquinone (juglone), which is extracted from the shells of fresh walnuts



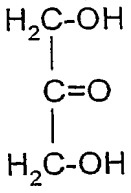
5-hydroxy-1,4-naphthoquinone (juglone)

and the 2-hydroxy-1,4-naphthoquinone (lawsone) which occurs in henna leaves.



2-hydroxy-1,4-naphthoquinone (lawsone)

The most important active ingredient for self-tanning according to the present invention is 1,3-dihydroxyacetone (DHA), a trivalent sugar which occurs in the human body.



1,3-dihydroxyacetone (DHA)

The concentration of the at least one self-tanning substance preferred according to the invention is in the range from 0.01 to 15 % by weight, preferably in the range from 0.05 to 5 % by weight and particularly preferably at most 1% by weight. It may be particularly preferred here according to the invention if mixtures of self-tanning substances are used. In particular, it is preferred here to use DHA in a mixture with at least one

other self-tanning substance.

It is assumed that the effect, advantageous according to the invention, of the improved tanning effect at elevated temperatures in the case of 1,3-dihydroxyacetone is connected with the following mechanism. As a raw material, DHA is in the form of a powder and consists of dimers. Dissolved in water, some of the dimers convert to the active monomeric form, which brings about the tanning reaction. At an elevated water temperature, the amount of monomers increases. For example, it has been found that in DHA solutions at 30-50°C up to 30% more active DHA monomers are present than in DHA solutions at 20°C. At the same time, the elevated temperature increases the reaction rate of the tanning reaction.

For this reason, it is preferred according to the invention if the application temperature is in the range between 25 and 60°C, preferably between 30 and 55°C and particularly preferably between 37 and 50°C.

In addition, it has been found that the equilibrium of the monomer to dimer concentration is established within about 15 minutes following dissolution. It is therefore preferred according to the invention when the solution of the self-tanning substance is tempered for about 15 min, but at least about 10 min, before the solution is applied to the human skin.

In a particularly comfortable manner, said effect can be exploited when used in bath tubs.

The required evenness of tanning can only be achieved with difficulty, or not at all, by mere rubbing. In addition, some areas of the body, in particular on the back, can only be reached with difficulty during self-application of a cream. These problems are avoided with application as bath water. In addition, the application can take place during the customary bathing time, and penetration of the self-tanning agents into the deeper

layers of horny skin is favoured by the softening of the skin during bathing.

According to the invention, it is therefore particularly preferred when the solution is applied in a bathtub or whirlpool. The intensive and long-lasting contact of the skin with the active ingredient solution additionally achieves particularly even tanning, which is, in addition, possible with particularly low active ingredient concentrations.

Whirlpools or other baths with an agitated surface in particular offer the additional advantage that no line arises in the neck area, but a continuous fading of the tan arises. If the intention is to also tan the face, then this can be done in a classical way by applying a self-tan-containing cream or by misting with a self-tan solution.

In the corresponding process according to the invention, the human body, as a whole or partially, is immersed into the solution.

Another method, preferred according to the invention, of applying self-tan solutions to the skin is misting, which can take place, for example, by means of a shower or spray gun.

In the corresponding process, for even tanning, the human body - completely or partially - is sprayed evenly with the tempered solution.

The skin tanning achieved in this way cannot be washed off and is removed only with normal shedding of the skin (after about 10-15 days).

The addition of hydrophilic solvents increases the intensity of the tanning. As a result, it is possible to further reduce the concentration of the self-tanning substance. In addition, the hydrophilic solvents are able to ensure a more even distribution of the self-tanning substance, particularly when applied by misting.

The hydrophilic solvents to be used according to the invention can advantageously be chosen from the following groups of substances:

- monoalcohols of low carbon number, e.g. isopropanol,
- polyhydric alcohols, such as, preferably, propylene glycol or glycerol,
- esters of fatty alcohols with alkanoic acids of low carbon number.

The hydrophilic solvents preferred according to the invention are propylene glycol and/or glycerol.

The preferred concentration of hydrophilic solvents, in particular propylene glycol and/or glycerol, in formulations according to the invention is in the range from 0.1 to 50 % by weight, more preferred in the range from 0.5 to 20 % by weight.

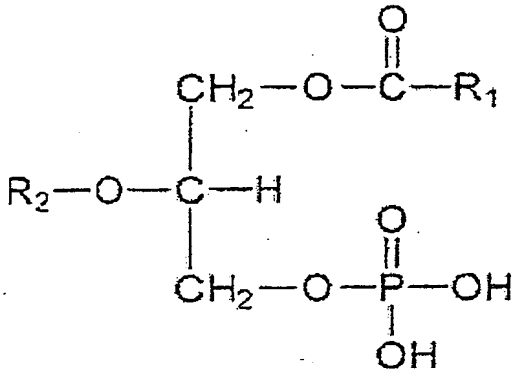
In addition, the presence of so-called fatty carriers should lead to increased tanning intensity. The substances called fatty carriers according to the invention are generally also referred to as "sluices" since they transport the self-tanning agent molecules to deeper layers of the stratum corneum.

Fatty carriers to be mentioned here are, in particular, ceramides, cholesterol, phospholipids, cholesteryl sulphate, cholesteryl phosphate, phosphatidylcholine, lecithin and/or empty liposomes.

According to the invention, phospholipids means the following substances: phosphatidic acids, the actual lecithins, cardolipins, lysophospholipids, lysolecithins, plasmalogens, phosphosphingolipids, sphingomyelins. Preferred substances are described below.

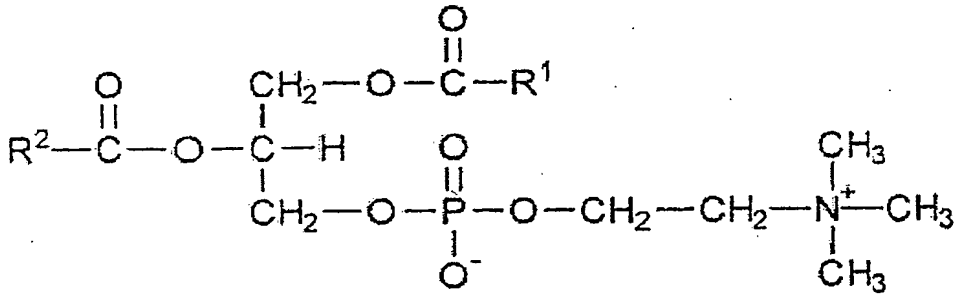
Phosphatidic acids are glycerol derivatives which are esterified in the 1-sn and 2 position with fatty acids (1-sn position: mostly saturated, 2 position:

mostly mono- or polyunsaturated), on atom 3-sn by contrast with phosphoric acid and characterized by the general structural formula



In the phosphatidic acids occurring in human or animal tissue, the phosphate radical is mostly esterified with amino alcohols, such as choline (lecithin = 3-sn-phosphatidylcholine) or 2-aminoethanol (ethanolamine) or L-serine (cephalin = 3-sn-phosphatidylethanolamine or sn-phosphatidyl-L-serine), with myo-inositol to give the phosphoinositides common in tissues [1-(3-sn-phosphatidyl)-d-myo-inositols], with glycerol to give phosphatidyl-glycerols. Particular preference is given to lecithins (= 3-sn-phosphatidyl-choline).

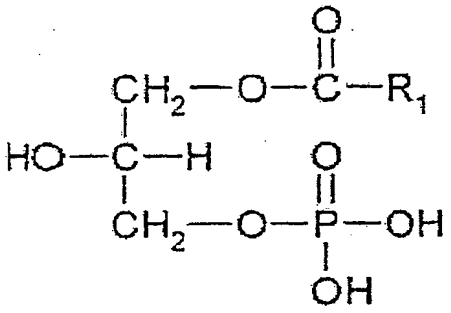
Lecithins are characterized by the general structural formula



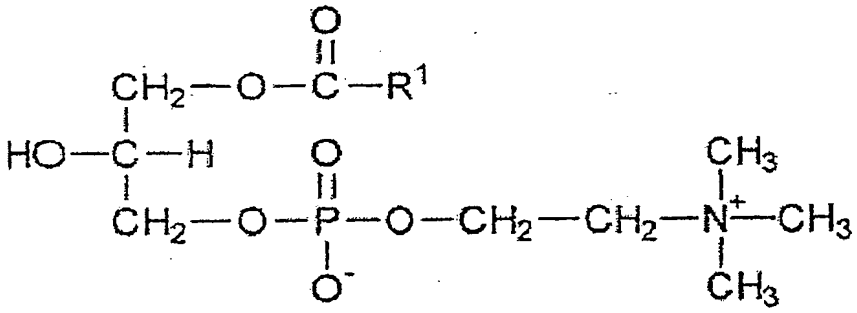
where R^1 and R^2 are typically unbranched aliphatic radicals having 15 or 17 carbon atoms and up to 4 cis double bonds.

Cardiolipins (1,3-bisphosphatidylglycerols) are phospholipids comprising two phosphatidic acids joined via glycerol.

Lysophospholipids are obtained when an acyl radical is cleaved off from phospholipids by phospholipase A (e.g. lysolecithins). Lysophospholipids are characterized by the general structural formula



Lysolecithins, for example, are characterized by the general structural formula

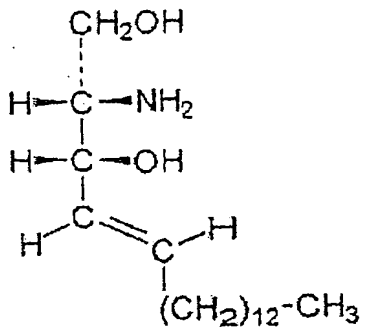


where R^1 is typically unbranched aliphatic radicals having 15 or 17 carbon atoms and up to 4 cis double bonds.

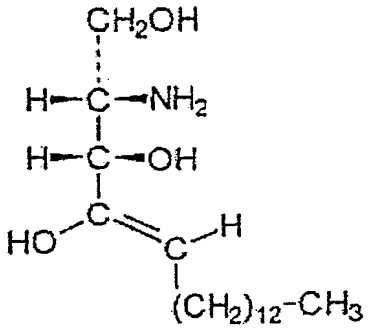
The phospholipids also include plasmalogens, in which instead of a fatty acid in the 1 position, an aldehyde (in the form of an enol ether) is bonded; the O-1-sn-alkenyl compounds corresponding to the phosphatidylcholines

are, for example, called phosphatidalcholines.

As basic structure, the phosphosphingolipids are based on sphingosine or else phytosphingosine, which are characterized by the following structural formulae:

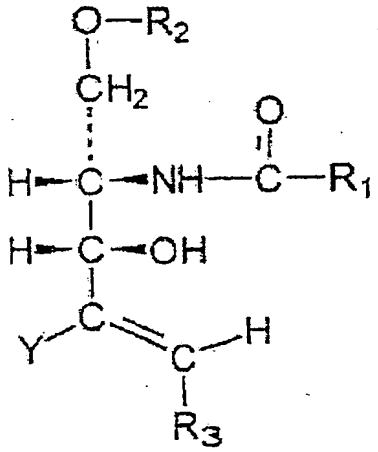


(sphingosine)



(phytosphingosine)

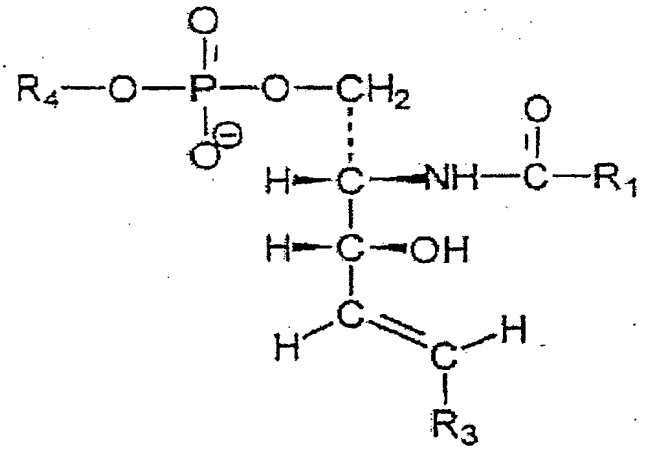
Modifications of sphingolipids are characterized, for example, by the general basic structure



in which R_1 and R_3, independently of one another, are saturated or unsaturated, branched or unbranched alkyl radicals having 1 to 28 carbon atoms, R_2 is chosen from the group: hydrogen atom, saturated or unsaturated, branched or unbranched alkyl radicals having 1 to 28 carbon

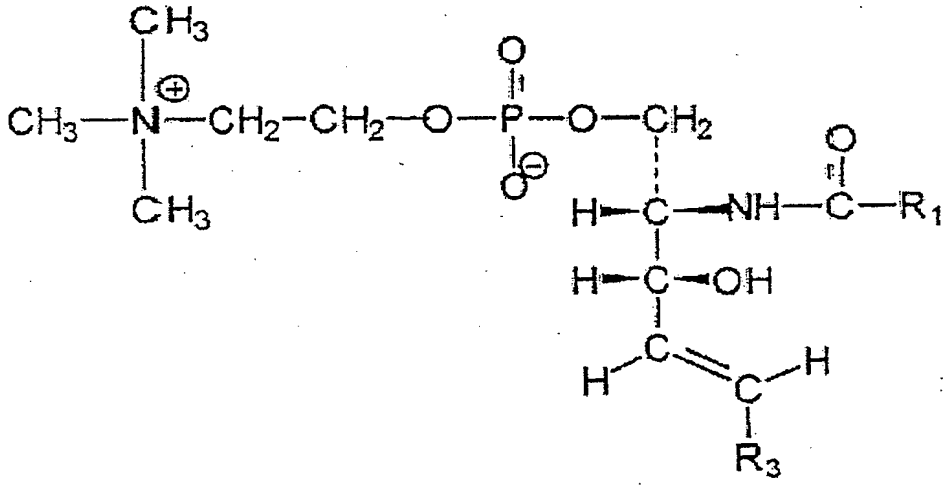
atoms, sugar radicals, phosphate groups which are unesterified or esterified with organic radicals, sulphate groups which are unesterified or esterified with organic radicals, and Y is either a hydrogen atom, a hydroxyl group or another heterofunctional radical.

Sphingophospholipids



R_1 and R_3 are alkyl radicals, R_4 is an organyl radical.

Sphingomyelins are organylphosphorylated sphingolipids of the type



Particularly preferred phospholipids are lecithins. Lecithin types to be used advantageously are chosen from crude lecithins which have been deoiled and/or fractionated and/or spray-dried and/or acetylated and/or hydrolysed and/or hydrogenated. They are commercially available. Preference is given to soya lecithins.

According to the invention, use is advantageously made of ceramides, cholesterol, phospholipids, fatty acids, cholesteryl sulphate, cholesteryl phosphate, phosphatidylcholine, lecithin and/or empty liposomes.

Phospholipids to be used advantageously according to the invention can, for example, be acquired commercially under the trade names Phospholipon 25 or Phospholipon 90 (Natterman), Emulmetik 120 (Lucas Meyer), Sternpur E (Stern), Sternpur PM (Stern), Nathin 3KE (Stern), Phospholipon 90 H (Nattermann/Rhone-Poulenc), Lipoid S 100 (Lipoid).

According to the invention, the preferred concentration of fatty carriers is in the range from 0.1 to 50 % by weight, more preferred in the range from 0.5 to 10 % by weight of fatty carrier.

The preparations according to the invention are suitable on the one hand for the application according to the invention. On the other hand, these formulations, however, are also to be used advantageously in the form of creams since improved absorption and penetration behaviour also facilitate even distribution of a cream.

Under the influence of ultraviolet radiation, DHA can cleave off formaldehyde in small amounts. It is therefore preferred according to the invention when the formulations for the stabilization comprise UV filters. Since these UV filters also come into contact with the skin during application of the formulation, they should be UV filters which are compatible in the topical application. In this connection, an additional

advantage which arises is that these UV filters likewise absorb evenly on the skin upon application and thus protect the skin against UV radiation.

Particular preference is given to those UV filters whose physiological safety has already been demonstrated. There are substances known from the specialist literature both for UV-A and also UV-B filters, e.g. benzylidene-camphor derivatives, such as 3-(4'-methylbenzylidene)-dl-camphor (e.g. Eusolex® 6300), 3-benzylidenecamphor (e.g. Mexoryl® SD), polymers of N-{(2 and 4)-[(2-oxoborn-3-ylidene)methyl]benzyl}acrylamide (e.g. Mexoryl® SW), N,N,N-trimethyl-4-(2-oxoborn-3-ylidenemethyl)anilinium methylsulphate (e.g. Mexoryl® SK) or (2-oxoborn-3-ylidene)toluene-4-sulphonic acid (e.g. Mexoryl® SL),

benzoyl- or dibenzoylmethanes, such as 1-(4-tert-butylphenyl)-3-(4-methoxyphenyl)propane-1,3-dione (e.g. Eusolex® 9020) or 4-isopropyl-dibenzoylmethane (e.g. Eusolex® 8020),

benzophenones, such as 2-hydroxy-4-methoxybenzophenone (e.g. Eusolex® 4360) or 2-hydroxy-4-methoxybenzophenone-5-sulphonic acid and its sodium salt (e.g. Uvinul® MS-40),

methoxycinnamic esters, such as octyl methoxycinnamate (e.g. Eusolex® 2292), isopentyl 4-methoxycinnamate, e.g. as a mixture of the isomers (e.g. Neo Heliopan® E 1000),

salicylate derivatives, such as 2-ethylhexyl salicylate (e.g. Eusolex® OS), 4-isopropylbenzyl salicylate (e.g. Megasol®) or 3,3,5-trimethylcyclohexyl salicylate (e.g. Eusolex® HMS),

4-aminobenzoic acid and derivatives, such as 4-aminobenzoic acid, 2-ethylhexyl 4-(dimethylamino)benzoate (e.g. Eusolex® 6007), ethoxylated

ethyl 4-aminobenzoate (e.g. Uvinul® P25),

phenylbenzimidazolesulphonic acids, such as 2-phenylbenzimidazole-5-sulphonic acid and its potassium, sodium and triethanolamine salts (e.g. Eusolex® 232), 2,2-(1,4-phenylene)bisbenzimidazole-4,6-disulphonic acid and salts thereof (e.g. Neo Heliopan® AP) or 2,2-(1,4-phenylene)bis-benzimidazole-6-sulphonic acid;

and further substances, such as

- 2-ethylhexyl 2-cyano-3,3-diphenylacrylate (e.g. Eusolex® OCR),
- 3,3'-(1,4-phenylenedimethylene)bis(7,7-dimethyl-2-oxobicyclo[2.2.1]hept-1-ylmethanesulphonic acid, and its salts (e.g. Mexoryl® SX) and
- 2,4,6-trianilino(p-carbo-2'-ethylhexyl-1'-oxy)-1,3,5-triazine (e.g. Uvinul® T 150)
- hexyl 2-(4-diethylamino-2-hydroxybenzoyl)benzoate (e.g. Uvinul®UVA Plus, BASF).

The compounds listed are only to be regarded as examples. It is of course also possible to use other UV filters.

These organic UV filters are usually incorporated into cosmetic formulations in an amount of from 0.5 to 10 % by weight, preferably 1-8%.

Further suitable organic UV filters are, for example,

- 2-(2H-benzotriazol-2-yl)-4-methyl-6-(2-methyl-3-(1,3,3,3-tetramethyl-1-(trimethylsilyloxy)disiloxanyl)propyl)phenol (e.g. Silatrizole®),
- bis(2-ethylhexyl) 4,4'-[(6-[4-((1,1-dimethylethyl)aminocarbonyl)phenyl-amino]-1,3,5-triazine-2,4-diyl)diimino]bis(benzoate) (e.g. Uvasorb® HEB),
- dimethicone diethylbenzalmalonate (CAS No. 207 574-74-1)
- 2,2'-methylenebis-(6-(2H-benzotriazol-2-yl)-4-(1,1,3,3-tetramethylbutyl)-

phenol) (CAS No. 103 597-45-1)

- 2,2'-(1,4-phenylene)bis(1H-benzimidazole-4,6-disulphonic acid, monosodium salt) (CAS No. 180 898-37-7) and
- 2,4-bis{[4-(2-ethylhexyloxy)-2-hydroxy]phenyl}-6-(4-methoxyphenyl)-1,3,5-triazine (CAS No. 103 597-45-, 187 393-00-6).

Further suitable UV filters are also methoxyflavones corresponding to the earlier German patent application DE 10232595.2.

Organic UV filters are usually incorporated into cosmetic formulations in an amount of from 0.5 to 20 % by weight, preferably 1-15%.

Conceivable inorganic UV filters are those from the group of titanium dioxides, such as, for example, coated titanium dioxide (e.g. Eusolex® T-2000, Eusolex®T-AQUA), zinc oxides (e.g. Sachtotec®), iron oxides and also cerium oxides. These inorganic UV filters are usually incorporated into cosmetic preparations in an amount of from 0.5 to 20 % by weight, preferably 2-10%.

Preferred compounds with UV-filtering properties are 3-(4'-methylbenzylidene)-dl-camphor, 1-(4-tert-butylphenyl)-3-(4-methoxyphenyl)-propane-1,3-dione, 4-isopropyldibenzoylmethane, 2-hydroxy-4-methoxybenzophenone, octyl methoxycinnamate, 3,3,5-trimethylcyclohexyl salicylate, 2-ethylhexyl 4-(dimethylamino)benzoate, 2-ethylhexyl 2-cyano-3,3-diphenylacrylate, 2-phenylbenzimidazol-5-sulphonic acid, and its potassium, sodium and triethanolamine salts.

Optimized compositions can, for example, comprise the combination of the organic UV filters 4'-methoxy-6-hydroxyflavone with 1-(4-tert-butylphenyl)-3-(4-methoxyphenyl)propane-1,3-dione and 3-(4'-methylbenzylidene)-dl-camphor. This combination gives rise to broadband protection, which can be further enhanced by adding inorganic UV filters, such as titanium

dioxide microparticles.

All said UV filters can also be used in encapsulated form. In particular, it is advantageous to use organic UV filters in encapsulated form. Specifically, the following advantages arise:

- The hydrophilicity of the capsule wall may be adjusted independently of the solubility of the UV filter. Thus, for example, even hydrophobic UV filters can be incorporated into purely aqueous preparations. In addition, the oily impression, often perceived as being unpleasant, upon application of the preparation comprising hydrophobic UV filters is suppressed.
- Certain UV filters, in particular dibenzoylmethane derivatives, exhibit only reduced photostability in cosmetic preparations. By encapsulating these filters or compounds which impair the photostability of these filters, such as, for example, cinnamic acid derivatives, it is possible to increase the photostability of the entire preparation.
- The literature discusses time and again the penetration of the skin by organic UV filters and the associated irritancy potential upon direct application to the human skin. The encapsulation of the corresponding substances that is proposed here suppresses this effect.
- In general, by encapsulating individual UV filters or other ingredients it is possible to avoid preparation problems which arise as a result of individual preparation constituents interacting with one another, such as crystallization operations, precipitations and agglomeration, since the interaction is suppressed.

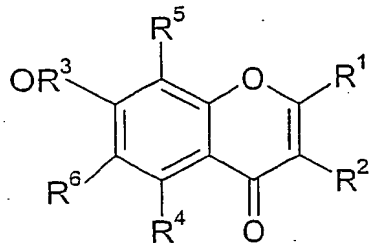
It is therefore preferred according to the invention when one or more of the abovementioned UV filters are present in encapsulated form. In this connection, it is advantageous if the capsules are so small that they cannot be observed with the naked eye. To achieve the abovementioned effects, it is further necessary that the capsules are sufficiently stable and do not release the encapsulated active ingredient (UV filter), or release it only to a low degree, into the surrounding area.

Suitable capsules can have walls made of inorganic or organic polymers. For example, US 6,242,099 B1 describes the preparation of suitable capsules with walls made of chitin, chitin derivatives or polyhydroxylated polyamines. Capsules which are to be used particularly preferably according to the invention have walls which can be obtained by a sol gel process, as is described in the applications WO 00/09652, WO 00/72806 and WO 00/71084. Preference is given here in turn to capsules whose walls are made of silica gel (silica; undefined silicon oxide hydroxide). The preparation of the corresponding capsules is known to the person skilled in the art, for example from the cited patent applications, the contents of which also expressly belong to the subject-matter of the present application.

In this connection, the capsules are preferably present in preparations according to the invention in amounts which ensure that the encapsulated UV filters are present in the preparation in the amounts given above.

The preparations according to the invention can, moreover, comprise further customary gentle or skincare active ingredients. These may in principle be all active ingredients known to the person skilled in the art.

These may be chromone derivatives. In this connection, the term chromone derivative is preferably understood as meaning certain chromen-2-one derivatives which are suitable as active ingredients for the preventative treatment of human skin and human hair against ageing processes and harmful environmental influences. At the same time, they display a low irritation potential for the skin, have a positive influence on the water binding in the skin, maintain or increase the elasticity of the skin and thus promote skin smoothing. These compounds preferably correspond to the formula I



I

where

R^1 and R^2 may be identical or different and are chosen from

- H, -C(=O)-R^7, -C(=O)-OR^7,
- straight-chain or branched C_1- to C_{20}-alkyl groups,
- straight-chain or branched C_3- to C_{20}-alkenyl groups, straight-chain or branched C_1- to C_{20}-hydroxyalkyl groups, where the hydroxyl group may be bonded to a primary or secondary carbon atom of the chain and in addition the alkyl chain may also be interrupted by oxygen, and/or
- C_3- to C_{10}-cycloalkyl groups and/or C_3- to C_{12}-cycloalkenyl groups, where the rings may in each case also be bridged by -$(CH_2)_n$ groups where n = 1 to 3,

R^3 is H or straight-chain or branched C_1- to C_{20}-alkyl groups,

R^4 is H or OR^8,

R^5 and R^6 may be identical or different and are chosen from

- -H, -OH,
- straight-chain or branched C_1- to C_{20}-alkyl groups,
- straight-chain or branched C_3- to C_{20}-alkenyl groups,
- straight-chain or branched C_1- to C_{20}-hydroxyalkyl groups, where the hydroxyl group may be bonded to a primary or secondary carbon atom of the chain and in addition the alkyl chain may also be interrupted by oxygen and

R^7 is H, straight-chain or branched C_1- to C_{20}-alkyl groups, a polyhydroxy compound, such as preferably an ascorbic acid radical or glycosidic radicals and

R^8 is H or straight-chain or branched C_1- to C_{20}-alkyl groups, where at least 2 of the substituents R^1, R^2, R^4-R^6 are different from H, or at least one

substituent of R^1 and R^2 is $-C(=O)-R^7$ or $-C(=O)-OR^7$.

The proportion of one or more compounds chosen from chromone derivatives in the preparation according to the invention is preferably from 0.001 to 5 % by weight, particularly preferably from 0.01 to 2 % by weight, based on the total preparation.

A protective effect against oxidative stress or against the effect of free radicals of the formulations according to the invention can be achieved when the preparations comprise one or more antioxidants, the person skilled in the art being presented with no difficulties at all in selecting antioxidants which act suitably rapidly or in a time-delayed manner.

There are many proven substances known from the specialist literature which can be used as antioxidants, e.g. amino acids (e.g. glycine, histidine, tyrosine, tryptophan) and derivatives thereof, imidazoles (e.g. urocanic acid) and derivatives thereof, peptides, such as D,L-carnosine, D-carnosine, L-carnosine and derivatives thereof (e.g. anserin), carotenoids, carotenes (e.g. α-carotene, β-carotene, lycopene) and derivatives thereof, chlorogenic acid and derivatives thereof, lipoic acid and derivatives thereof (e.g. dihydrolipoic acid), aurothioglucose, propylthiouracil and other thiols (e.g. thioredoxin, glutathione, cysteine, cystine, cystamine and the glycosyl, N-acetyl, methyl, ethyl, propyl, amyl, butyl and lauryl, palmitoyl, oleyl, γ-linoleyl, cholesteryl and glyceryl esters thereof), and salts thereof, dilauryl thiodipropionate, distearyl thiodipropionate, thiodipropionic acid and derivatives thereof (esters, ethers, peptides, lipids, nucleotides, nucleosides and salts), and sulphoximine compounds (e.g. buthionine sulphoximines, homocysteine sulphoximine, buthionine sulphones, penta-, hexa-, heptathionine sulphoximine) in very low tolerated doses (e.g. pmol to μmol/kg), and also (metal) chelating agents (e.g. α-hydroxy fatty acids, palmitic acid, phytic acid, lactoferrin), α-hydroxy acids (e.g. citric acid, lactic acid, malic acid),

humic acid, bile acid, bile extract, bilirubin, biliverdin, EDTA, EGTA and derivatives thereof, unsaturated fatty acids and derivatives thereof, vitamin C and derivatives (e.g. ascorbyl palmitate, magnesium ascorbyl phosphate, ascorbyl acetate), tocopherols and derivatives (e.g. vitamin E acetate), vitamin A and derivatives (e.g. vitamin A palmitate), and coniferyl benzoate of benzoin resin, rutinic acid and derivatives thereof, α-glycosylrutin, ferulic acid, furfurylideneglucitol, carnosine, butylhydroxytoluene, butylhydroxyanisole, nordihydroguaiaretic acid, trihydroxybutyrophenone, quercitin, uric acid and derivatives thereof, mannose and derivatives thereof, zinc and derivatives thereof (e.g. ZnO, $ZnSO_4$), selenium and derivatives thereof (e.g. selenomethionine), stilbenes and derivatives thereof (e.g. stilbene oxide, trans-stilbene oxide).

Mixtures of antioxidants are likewise suitable for use in the cosmetic preparations according to the invention. Known and commercial mixtures are, for example, mixtures comprising, as active ingredients, lecithin, L-(+)-ascorbyl palmitate and citric acid (e.g. Oxynex® AP), natural tocopherols, L-(+)-ascorbyl palmitate, L-(+)-ascorbic acid and citric acid (e.g. Oxynex® K LIQUID), tocopherol extracts from natural sources, L-(+)-ascorbyl palmitate, L-(+)-ascorbic acid and citric acid (e.g. Oxynex® L LIQUID), DL-α-tocopherol, L-(+)-ascorbyl palmitate, citric acid and lecithin (e.g. Oxynex® LM) or butylhydroxytoluene (BHT), L-(+)-ascorbyl palmitate and citric acid (e.g. Oxynex® 2004). Antioxidants of this type are used with compounds of the formula I in such compositions usually in ratios in the range from 1000:1 to 1:1000, preferably in amounts of from 100:1 to 1:100.

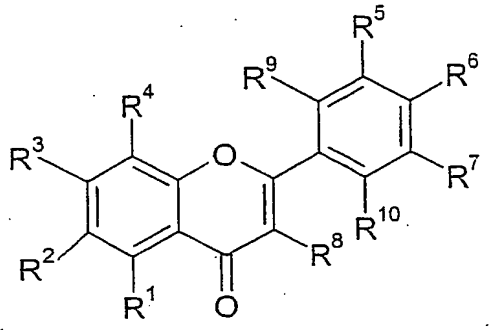
The preparations according to the invention may comprise vitamins as further ingredients. Preferably, vitamins and vitamin derivatives chosen from vitamin A, vitamin A propionate, vitamin A palmitate, vitamin A acetate, retinol, vitamin B, thiamine chloride hydrochloride (vitamin B_1), riboflavin (vitamin B_2), nicotinamide, vitamin C (ascorbic acid), vitamin D,

ergocalciferol (vitamin D_2), vitamin E, DL-α-tocopherol, tocopherol E acetate, tocopherol hydrogensuccinate, vitamin K_1, esculin (vitamin P active ingredient), thiamine (vitamin B_1), nicotinic acid (niacin), pyridoxine, pyridoxal, pyridoxamine, (vitamin B_6), pantothenic acid, biotin, folic acid and cobalamin (vitamin B_{12}) are present in the cosmetic preparations according to the invention, particularly preferably vitamin A palmitate, vitamin C and derivatives thereof, DL-α-tocopherol, tocopherol E acetate, nicotinic acid, pantothenic acid and biotin. Vitamins are used here with compounds of the formula I usually in ratios in the range from 1000:1 to 1:1000, preferably in amounts of from 100:1 to 1:100.

Among the phenols with an antioxidative effect, the polyphenols, some of which occur as natural substances, are particularly interesting for applications in the pharmaceutical, cosmetic or nutrition field. For example, the flavonoids or bioflavonoids, known primarily as plant dyes, often have an antioxidative potential. Effects of the substitution pattern of mono- and dihydroxyflavones are dealt with by K. Lemanska, H. Szymusiak, B. Tyrakowska, R. Zielinski, I.M.C.M. Rietjens; Current Topics in Biophysics 2000, 24(2), 101-108. It is observed therein that dihydroxyflavones with an OH group adjacent to the keto function or OH groups in 3'4' or 6,7 or 7,8 position have antioxidative properties, whereas some other mono- and dihydroxyflavones have no antioxidative properties.

Quercetin (cyanidanol, cyanidenolon 1522, meletin, sophoretin, ericin, 3,3',4',5,7-pentahydroxyflavone) is often specified as a particularly effective antioxidant (e.g. C.A. Rice-Evans, N.J. Miller, G. Paganga, Trends in Plant Science 1997, 2(4), 152-159). K. Lemanska, H. Szymusiak, B. Tyrakowska, R. Zielinski, A.E.M.F. Soffers, I.M.C.M. Rietjens; Free Radical Biology & Medicine 2001, 31(7), 869-881 investigate the pH dependency of the antioxidative effect of hydoxyflavones. Over the entire pH range, quercetin exhibits the highest activity of the investigated structures.

Suitable antioxidants are also compounds of the formula II



II

where R^1 to R^{10} may be identical or different and are chosen from

- H
- OR^{11}
- straight-chain or branched C_1- to C_{20}-alkyl groups,
- straight-chain or branched C_3- to C_{20}-alkenyl groups,
- straight-chain or branched C_1- to C_{20}-hydroxyalkyl groups, where the hydroxyl group may be bonded to a primary or secondary carbon atom of the chain and in addition the alkyl chain may also be interrupted by oxygen, and/or
- C_3- to C_{10}-cycloalkyl groups and/or C_3- to C_{12}-cycloalkenyl groups, where the rings may in each case also be bridged by $-(CH_2)_n$ groups where n = 1 to 3,
- where all OR^{11}, independently of one another, are
  - OH
  - straight-chain or branched C_1- to C_{20}-alkyloxy groups,
  - straight-chain or branched C_3- to C_{20}-alkenyloxy groups,
  - straight-chain or branched C_1- to C_{20}-hydroxyalkoxy groups, where the hydroxyl group(s) may be bonded to a primary or secondary carbon atom of the chain and in addition the alkyl chain may also be interrupted by oxygen, and/or
  - C_3- to C_{10}-cycloalkyloxy groups and/or C_3- to C_{12}-

cycloalkenyloxy groups, where the rings may in each case also be bridged by $-(CH_2)_n$ groups where n = 1 to 3 and/or

- mono- and/or oligoglycosyl radicals,

with the proviso that at least 4 radicals from R^1 to R^7 are OH and that at least 2 pairs of adjacent -OH groups are present in the molecule,

- or R^2, R^5 and R^6 are OH and the radicals R^1, R^3, R^4 and R^{7-10} are H,

as are described in the earlier German patent application DE 10244282.7.

Particularly preferred active ingredients are also pyrimidinecarboxylic acids and/or aryl oximes.

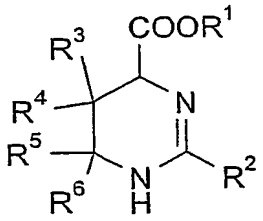
Pyrimidinecarboxylic acids occur in halophilic microorganisms and play a role in the osmoregulation of these organisms (*E. A. Galinski et al., Eur. J. Biochem., 149 (1985) page 135-139*). In this connection, among the pyrimidinecarboxylic acids, mention is made in particular of ectoin ((S)-1,4,5,6-tetrahydro-2-methyl-4-pyrimidinecarboxylic acid) and hydroxyectoin ((S,S)-1,4,5,6-tetrahydro-5-hydroxy-2-methyl-4-pyrimidinecarboxylic acid and derivatives thereof. These compounds stabilize enzymes and other biomolecules in aqueous solutions and organic solvents. In addition, they stabilize in particular enzymes against denaturing conditions, such as salts, extreme pH values, surfactants, urea, guanidinium chloride and other compounds.

Ectoin and ectoin derivatives, such as hydroxyectoin, can advantageously be used in medicaments. In particular, hydroxyectoin can be used for the preparation of a medicament for the treatment of skin disorders. Other fields of use of hydroxyectoin and other ectoin derivatives are typically in fields in which, for example, trehalose is used as additive. Thus, ectoin derivatives, such as hydroxyectoin, can be used as protectant in dried yeast and bacteria cells. Pharmaceutical products such as non-

glycosylated, pharmaceutically active peptides and proteins, e.g. t-PA, can also be protected with ectoin or its derivatives.

Among the cosmetic applications, mention is made in particular of the use of ectoin and ectoin derivatives for the care of aged, dry or irritated skin. For example, European patent application EP-A-0 671 161 describes, in particular, that ectoin and hydroxyectoin are used in cosmetic preparations such as powders, soaps, surfactant containing cleansing products, lipsticks, blusher, foundations, care creams and sunscreen preparations.

In this connection, preference is given to using a pyrimidinecarboxylic acid according to formula III below,



III

in which R^1 is a radical H or C_{1-8}-alkyl, R^2 is a radical H or C_{1-4}-alkyl and R^3, R^4, R^5 and R^6 are in each case independently of one another a radical from the group H, OH, NH_2 and C_{1-4}-alkyl. Preference is given to using pyrimidinecarboxylic acids in which R^2 is a methyl or an ethyl group, and R^1 or R^5 and R^6 are H. Particular preference is given to using the pyrimidinecarboxylic acids ectoin ((S)-1,4,5,6-tetrahydro-2-methyl-4-pyrimidinecarboxylic acid) and hydroxyectoin ((S,S)-1,4,5,6-tetrahydro-5-hydroxy-2-methyl-4-pyrimidinecarboxylic acid). In this connection, the preparations according to the invention comprise pyrimidinecarboxylic acids of this type preferably in amounts up to 15% by weight.

Among the aryl oximes, preference is given to using 2-hydroxy-5-methyllaurophenone oxime, which is also referred to as HMLO, LPO or F5.

Its suitability for use in cosmetic compositions is known, for example, from German laid-open specification DE-A-41 16 123. Preparations which comprise 2-hydroxy-5-methyllaurophenone oxime are accordingly suitable for the treatment of skin disorders which are accompanied by inflammations. It is known that preparations of this type can be used, for example, for the therapy of psoriasis, various forms of eczema, irritative and toxic dermatitis, UV dermatitis, and other allergic and/or inflammatory disorders of the skin and of skin appendages. In this connection, the preparations preferably comprise 0.01 to 10% by weight of the aryl oxime, it being particularly preferred if the preparation comprises 0.05 to 5% by weight of aryl oxime.

In addition, the preparations according to the invention can also comprise dyes and colour pigments. The dyes and colour pigments can be chosen from the corresponding positive list of the Cosmetics Directive or the EC list of cosmetic colorants. In most cases, they are identical to the dyes permitted for foods. Advantageous colour pigments are, for example, titanium dioxide, mica, iron oxides (e.g. Fe_2O_3, Fe_3O_4, FeO(OH)) and/or tin oxide. Advantageous dyes are, for example, carmine, Prussian blue, chromium oxide green, ultramarine blue and/or manganese violet. It is particularly advantageous to choose the dyes and/or colour pigments from the following list. The Colour Index numbers (CIN) are taken from the Rowe Colour Index, 3rd edition, Society of Dyers and Colourists, Bradford, England, 1971.

Chemical or other name	CIN	Colour
Pigment Green	10006	Green
Acid Green 1	10020	Green
2,4-Dinitrohydroxynaphthalene-7-sulphonic acid	10316	Yellow
Pigment Yellow 1	11680	Yellow
Pigment Yellow 3	11710	Yellow

Chemical or other name	CIN	Colour
Pigment Orange 1	11725	Orange
2,4-Dihydroxyazobenene	11920	Orange
Solvent Red 3	12010	Red
1-(2'-Chloro-4'-nitro-1'-phenylazo)-2-hydroxy-naphthalene	12085	Red
Pigment Red 3	12120	Red
Ceres red; Sudan red; Fat Red G	12150	Red
Pigment Red 112	12370	Red
Pigment Red 7	12420	Red
Pigment Brown 1	12480	brown
4-(2'-Methoxy-5'-sulphodiethylamido-1'-phenylazo)-3-hydroxy-5"-chloro-2",4"-dimethoxy-2-naphthanilide	12490	red
Disperse Yellow 16	12700	yellow
1-(4-Sulpho-1-phenylazo)-4-aminobenzene-5-sulphonic acid	13015	yellow
2,4-Dihydroxyazobenzene-4'-sulphonic acid	14270	orange
2-(2,4-Dimethylphenylazo-5-sulpho)-1-hydroxy-naphthalene-4-sulphonic acid	14700	Red
2-(4-Sulpho-1-naphthylazo)-1-naphthol-4-sulphonic acid	14720	Red
2-(6-Sulpho-2,4-xylylazo)-1-naphthol-5-sulphonic acid	14815	Red
1-(4'-Sulphophenylazo)-2-hydroxynaphthalene	15510	orange
1-(2-Sulpho-4-chloro-5-carboxy-1-phenylazo)-2-hydroxynaphthalene	15525	Red
1-(3-Methylphenylazo-4-sulpho)-2-hydroxynaphthalene	15580	Red
1-(4',(8')-Sulphonaphthylazo)-2-hydroxynaphthalene	15620	Red
2-Hydroxy-1,2'-azonaphthalene-1'-sulphonic acid	15630	Red
3-Hydroxy-4-phenylazo-2-naphthylcarboxylic acid	15800	Red
1-(2-Sulpho-4-methyl-1-phenylazo)-2-naphthylcarboxylic acid	15850	Red
1-(2-Sulpho-4-methyl-5-chloro-1-phenylazo)-2-hydroxy-naphthalene-3-carboxylic acid	15865	Red

Chemical or other name	CIN	Colour
1-(2-Sulpho-1-naphthylazo)-2-hydroxynaphthalene-3-carboxylic acid	15880	Red
1-(3-Sulpho-1-phenylazo)-2-naphthol-6-sulphonic acid	15980	orange
1-(4-Sulpho-1-phenylazo)-2-naphthol-6-sulphonic acid	15985	yellow
Allura Red	16035	red
1-(4-Sulpho-1-naphthylazo)-2-naphthol-3,6-disulphonic acid	16185	red
Acid Orange 10	16230	orange
1-(4-Sulpho-1-naphthylazo)-2-naphthol-6,8-disulphonic acid	16255	red
1-(4-Sulpho-1-naphthylazo)-2-naphthol-3,6,8-trisulphonic acid	16290	red
8-Amino-2-phenylazo-1-naphthol-3,6-disulphonic acid	17200	red
Acid Red 1	18050	red
Acid Red 155	18130	red
Acid Yellow 121	18690	yellow
Acid Red 180	18736	red
Acid Yellow 11	18820	yellow
Acid Yellow 17	18965	yellow
4-(4-Sulpho-1-phenylazo)-1-(4-sulphophenyl)-5-hydroxy-pyrazolone-3-carboxylic acid	19140	yellow
Pigment Yellow 16	20040	yellow
2,6-(4'-Sulpho-2",4"-dimethyl)bisphenylazo)1,3-dihydroxybenzene	20170	orange
Acid Black 1	20470	black
Pigment Yellow 13	21100	yellow
Pigment Yellow 83	21108	yellow
Solvent Yellow	21230	yellow
Acid Red 163	24790	red
Acid Red 73	27290	red

Chemical or other name	CIN	Colour
2-[4'-(4"-Sulpho-1"-phenylazo)-7'-sulpho-1'-naphthylazo]-1-hydroxy-7-aminonaphthalene-3,6-disulphonic acid	27755	black
4-[4"-Sulpho-1"-phenylazo)-7'-sulpho-1'-naphthylazo]-1-hydroxy-8-acetylaminonaphthalene-3,5-disulphonic acid	28440	black
Direct Orange 34, 39, 44, 46, 60	40215	orange
Food Yellow	40800	orange
trans-β-Apo-8'-carotinaldehyde (C_{30})	40820	orange
trans-Apo-8'-carotinic acid (C_{30})-ethyl ester	40850	orange
Canthaxanthin	40850	orange
Acid Blue 1	42045	blue
2,4-Disulpho-5-hydroxy-4'-4"-bis-(diethylamino)-triphenylcarbinol	42051	blue
4-[(-4-N-Ethyl-p-sulphobenzylamino)phenyl-(4-hydroxy-2-sulphophenyl)(methylene)-1-(N-ethyl-N-p-sulpho-benzyl)-2,5-cyclohexadienimine]	42053	green
Acid Blue 7	42080	blue
(N-Ethyl-p-sulphobenzylamino)phenyl-(2-sulphophenyl)-methylene-(N-ethyl-N-p-sulphobenzyl)$\Delta^{2,5}$-cyclohexa-dienimine	42090	blue
Acid Green 9	42100	green
Diethyl-di-sulphobenzyldi-4-amino-2-chlorodi-2-methyl-fuchsonimmonium	42170	green
Basic Violet 14	42510	violet
Basic Violet 2	42520	violet
2'-Methyl-4'-(N-ethyl-N-m-sulphobenzyl)amino-4"-(N-diethyl)amino-2-methyl-N-ethyl-N-m-sulphobenzyl-fuchsonimmonium	42735	blue
4'-(N-Dimethyl)amino-4"-(N-phenyl)aminonaphtho-N-dimethylfuchsonimmonium	44045	blue
2-Hydroxy-3,6-disulpho-4,4'-bisdimethylaminonaphtho-	44090	green

Chemical or other name	CIN	Colour
fuchsonimmonium		
Acid Red 52	45100	red
3-(2'-Methylphenylamino)-6-(2'-methyl-4'-sulphophenyl-amino)-9-(2"-carboxyphenyl)xanthenium salt	45190	violet
Acid Red 50	45220	red
Phenyl-2-oxyfluorone-2-carboxylic acid	45350	yellow
4,5-Dibromofluorescein	45370	orange
2,4,5,7-Tetrabromofluorescein	45380	red
Solvent Dye	45396	orange
Acid Red 98	45405	red
3',4',5',6'-Tetrachloro-2,4,5,7-tetrabromofluorescein	45410	red
4,5-Diiodofluorescein	45425	red
2,4,5,7-Tetraiodofluorescein	45430	red
Quinophthalone	47000	yellow
Quinophthalonedisulphonic acid	47005	yellow
Acid Violet 50	50325	violet
Acid Black 2	50420	black
Pigment Violet 23	51319	violet
1,2-Dioxyanthraquinone, calcium-aluminium complex	58000	red
3-Oxypyrene-5,8,10-sulphonic acid	59040	green
1-Hydroxy-4-N-phenylaminoanthraquinone	60724	violet
1-Hydroxy-4-(4'-methylphenylamino)anthraquinone	60725	violet
Acid Violet 23	60730	violet
1,4-Di(4'-methylphenylamino)anthraquinone	61565	green
1,4-Bis(o-sulpho-p-toluidino)anthraquinone	61570	green
Acid Blue 80	61585	blue
Acid Blue 62	62045	blue
N,N'-Dihydro-1,2,1',2'-anthraquinone azine	69800	blue
Vat Blue 6; Pigment Blue 64	69825	blue
Vat Orange 7	71105	orange

Chemical or other name	CIN	Colour
Indigo	73000	blue
Indigo-disulphonic acid	73015	blue
4,4'-Dimethyl-6,6'-dichlorothioindigo	73360	red
5,5'-Dichloro-7,7'-dimethylthioindigo	73385	violet
Quinacridone Violet 19	73900	violet
Pigment Red 122	73915	red
Pigment Blue 16	74100	blue
Phthalocyanine	74160	blue
Direct Blue 86	74180	blue
Chlorinated phthalocyanine	74260	green
Natural Yellow 6, 19; Natural Red 1	75100	yellow
Bixin, Norbixin	75120	orange
Lycopene	75125	yellow
trans-alpha-, beta- and gamma-carotene	75130	orange
Keto- and/or hydroxyl derivatives of carotene	75135	yellow
Guanine or pearlescent agent	75170	white
1,7-Bis(4-hydroxy-3-methoxyphenyl)-1,6-heptadiene-3,5-dione	75300	yellow
Complex salt (Na, Al, Ca) of carminic acid	75470	red
Chlorophyll a und b; copper compounds of chlorophylls and chlorophyllins	75810	green
Aluminium	77000	white
Hydrated alumina	77002	white
Hydrous aluminium silicate	77004	white
Ultramarine	77007	blue
Pigment Red 101 and 102	77015	red
Barium sulphate	77120	white
Bismuth oxychloride and its mixtures with mica	77163	white
Calcium carbonate	77220	white
Calcium sulphate	77231	white

Chemical or other name	CIN	Colour
Carbon	77266	black
Pigment Black 9	77267	black
Carbo medicinalis vegetabilis	77268	black
Chromium oxide	77288	green
Chromium oxide, hydrous	77278	green
Pigment Blue 28, Pigment Green 14	77346	green
Pigment Metal 2	77400	brown
Gold	77480	brown
Iron oxides and hydroxides	77489	orange
Iron oxide	77491	red
Iron oxide hydrate	77492	yellow
Iron oxide	77499	black
Mixtures of iron(II)- and iron(III)hexacyanoferrate	77510	blue
Pigment White 18	77713	white
Manganese ammonium diphosphate	77742	violet
Manganese phosphate; $Mn_3(PO_4)_2 \cdot 7\ H_2O$	77745	red
Silver	77820	white
Titanium dioxide and its mixtures with mica	77891	white
Zinc oxide	77947	white
6,7-Dimethyl-9-(1'-D-ribityl)isoalloxazine, lactoflavine		yellow
Sugar colouring		brown
Capsanthin, capsorubin		orange
Betanin		red
Benzopyrylium salts, anthocyans		red
Aluminium, zinc, magnesium and calcium stearate		white
Bromothymol blue		blue

It may also be favourable to choose as dye one or more substances from the following group: 2,4-dihydroxyazobenzene, 1-(2'-chloro-4'-nitro-1'-phenylazo)-2-hydroxynaphthalene, Ceres Red, 2-(4-sulpho-1-naphthylazo)-

1-naphthol-4-sulphonic acid, calcium salt of 2-hydroxy-1,2'-azonaphthalene-1'-sulphonic acid, calcium and barium salts of 1-(2-sulpho-4-methyl-1-phenylazo)-2-naphthylcarboxylic acid, calcium salt of 1-(2-sulpho-1-naphthylazo)-2-hydroxynaphthalene-3-carboxylic acid, aluminium salt of 1-(4-sulpho-1-phenylazo)-2-naphthol-6-sulphonic acid, aluminium salt of 1-(4-sulpho-1-naphthylazo)-2-naphthol-3,6-disulphonic acid, 1-(4-sulpho-1-naphthylazo)-2-naphthol-6,8-disulphonic acid, aluminium salt of 4-(4-sulpho-1-phenylazo)-1-(4-sulphophenyl)-5-hydroxypyrazolone-3-carboxylic acid, aluminium and zirconium salts of 4,5-dibromofluorescein, aluminium and zirconium salts of 2,4,5,7-tetrabromofluorescein, 3',4',5',6'-tetrachloro-2,4,5,7-tetrabromofluorescein and its aluminium salt, aluminium salt of 2,4,5,7-tetraiodofluorescein, aluminium salt of quinophthalone disulphonic acid, aluminium salt of indigo disulphonic acid, red and black iron oxide (CIN: 77 491 (red) and 77 499 (black)), iron oxide hydrate (CIN: 77 492), manganese ammonium diphosphate and titanium dioxide.

Also advantageous are oil-soluble natural dyes, such as, for example, paprika extract, β-carotene or cochineal.

Also advantageous for the purposes of the present invention are gel creams with a content of pearlescent pigments. Preference is given in particular to the types of pearlescent pigments listed below:

1. Natural pearlescent pigments, such as, for example
    1. "pearl essence" (guanine/hypoxanthin mixed crystals from fish scales) and
    2. "mother of pearl" (ground mussel shells)
2. Monocrystalline pearlescent pigments, such as, for example, bismuth oxychloride (BiOCl)
3. Layer-substrate pigments: e.g. mica/metal oxide.

Bases for pearlescent pigments are, for example, pulverulent pigments or castor oil dispersions of bismuth oxychloride and/or titanium dioxide,

and bismuth oxychloride and/or titanium dioxide on mica. The lustre pigment listed under CIN 77163, for example, is particularly advantageous.

Also advantageous are, for example, the following types of pearlescent pigment based on mica/metal oxide:

Group	Coating/layer thickness	Colour
Silver-white pearlescent pigments	TiO_2: 40-60 nm	silver
Interference pigments	TiO_2: 60-80 nm	yellow
	TiO_2: 80-100 nm	red
	TiO_2: 100-140 nm	blue
	TiO_2: 120-160 nm	green
Colour lustre pigments	Fe_2O_3	bronze
	Fe_2O_3	copper
	Fe_2O_3	red
	Fe_2O_3	red-violet
	Fe_2O_3	red-green
	Fe_2O_3	black
Combination pigments	TiO_2 / Fe_2O_3	gold shades
	TiO_2 / Cr_2O_3	green
	TiO_2 / Prussian blue	deep blue

Particular preference is given, for example, to the pearlescent pigments obtainable from Merck under the trade names Timiron, Colorona or Dichrona.

The list of given pearlescent pigments is not of course intended to be limiting. Pearlescent pigments which are advantageous for the purposes of the present invention are obtainable by numerous methods known per se. For example, other substrates apart from mica can be coated with further metal oxides, such as, for example, silica and the like. SiO_2 particles coated with, for example, TiO_2 and Fe_2O_3 ("ronaspheres"), which are

marketed by Merck and are particularly suitable for the optical reduction of fine lines, are advantageous.

It can moreover be advantageous to dispense completely with a substrate such as mica. Particular preference is given to pearlescent pigments which are prepared using SiO_2. Such pigments, which may also additionally have goniochromatic effects, are available, for example, under the trade name Sicopearl Fantastico from BASF.

In addition, pigments from Engelhard/Mearl based on calcium sodium borosilicate which have been coated with titanium dioxide can advantageously be used. These are available under the name Reflecks. In addition to the colour, they have a glitter effect as a result of their particle size of 40-80 µm.

In addition, also particularly advantageous are effect pigments which are obtainable under the trade name Metasomes Standard/Glitter in various colours (yellow, red, green, blue) from Flora Tech. The glitter particles are present here in mixtures with various auxiliaries and dyes (such as, for example, the dyes with the Colour Index (CI) Numbers 19140, 77007, 77289, 77491).

The dyes and pigments may be present either individually or in a mixture, and can be mutually coated with one another, different coating thicknesses generally giving rise to different colour effects. The total amount of dyes and colour-imparting pigments is advantageously chosen from the range from e.g. 0.1% by weight to 30% by weight, preferably from 0.5 to 15% by weight, in particular from 1.0 to 10% by weight, in each case based on the total weight of the preparations.

All compounds or components which can be used in the preparations are either known and available commercially or can be synthesized by known

processes.

The preparations according to the invention can, moreover, comprise further customary skin-friendly or skincare active ingredients. These may in principle be all active ingredients known to the person skilled in the art.

The cosmetic formulation of the present invention may be in the form of liquid, creamy, milky or gel-like bath additives which are added as liquid together with the bath water, or in bath capsules which preferably consist of gelatin and which dissolve in the bathwater and release the cosmetic formulation of the present invention.

The present invention thus further provides a cosmetic formulation comprising at least one self-tanning substance, characterized in that the formulation is liquid, creamy, milky and/or gel-like bath additives, bath tablets, bath salts and/or bath capsules.

One possible composition of the liquid formulation comprises up to 75% surfactants (anionic, cationic, nonionic or amphoteric), up to 10% viscosity agents, such as fatty alcohols, up to 5% combability and conditioning agents, up to 5% further ingredients, such as refatting agents, thickeners, opacifiers or pigments, up to 5% perfume oils, up to 1% preservatives, up to 0.5% sequestrants, up to 1% dyes, 0.1-1% DHA, UV filters, 0.1-20% propylene glycol and/or glycerol and 0.1 and 10% fatty carriers and is made up to 100% with water.

The cosmetic formulation of the present invention may also be present in bath additives such as bath tablets or bath salts. One possible composition of the solid formulation comprises up to 90% sodium salts (e.g. sodium carbonate, bicarbonate, sesquicarbonate, chloride, thiosulphate, borate, phosphate or citrate), up to 40% organic acids (e.g. tartaric acid, citric acid) for effervescent preparations, up to 5% perfume oils (essential oils), up to

5% skincare substances, up to 5% plant oils, up to 5% fillers and for tablets, disintegration auxiliaries (e.g. dextrin, silica, cellulose, gum), up to 5% binders, up to 2% surfactants, up to 1% dyes, 0.1-1% DHA, UV filters, 0.1-20% propylene glycol and/or glycerol and 0.1 and 10% fatty carriers.

In addition, it is preferred when the self-tanning formulations comprise moisture-donating substances, such as, for example, erythrulose or the abovementioned ectoins.

Particularly in the case of application as a bath, it may be further preferred for a water-repelling preparation to be applied to parts of the body which are not to be tanned, or are to be tanned only slightly. Such preparations can be prepared on the basis of silicones, paraffins, various organic polymers, petroleum or fatty acid salts, such as stearates. During bathing, they prevent or reduce the treated skin coming into contact with the self-tanning agent and thus the achieved tanning. Particularly on parts of the body with thickened horny skin, such a pretreatment may be advisable in order to prevent intense coloration of these areas.

As well as the self-tanning preparation, for bath use in particular, it may also be advantageous to also add amino acids, oligoamino acids or proteins, which react in situ with the self-tanning agent. Compounds to be added in preference here are in particular lysine, glycine, methionine and methionine sulphoxide. An advantageous dosing form here is a two-layer tablet, one layer of which comprises the self-tanning agent, and the other layer of which comprises the amino acids.

The examples below serve to illustrate the present invention in more detail without limiting its scope.

Example

Foam bath

Ingredient	[%]
Dihydroxyacetone	0.1-1
Surfactant	10-20
Phospholipids	5
Preservative	q.s.
Colorant	q.s.
Perfume oil	q.s.
Water	ad 100

Preparation:

The ingredients are mixed.

Formulation for misting in active-ingredient showers

Ingredient	[%]
Dihydroxyacetone	5
Propylene glycol	10
Phospholipids	5
Preservative	q.s.
Perfume oil	q.s.
Water	ad 100

Preparation:

The ingredients are mixed.